

Claims

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1. A method for preparing a population of cells for enhancing the growth or maintenance of hematopoietic progenitor cells, the method comprising:

5 contacting a cell expressing a PTH/PTHrP receptor with an agent that activates the PTH/PTHrP receptor in an amount effective to support the growth or maintenance of hematopoietic progenitor cells.

2. The method of claim 1, wherein the cell expressing a PTH/PTHrP receptor is present
10 in the immediate vicinity of a hematopoietic progenitor cell.

3. The method of claim 1, wherein the cell expressing a PTH/PTHrP receptor is chosen from an osteoblast, a lymphoreticular stromal cell, and a mixture of osteoblasts and lymphoreticular stromal cells.

15 4. The method of claim 1, wherein said contacting the cell expressing a PTH/PTHrP receptor with an agent that activates the PTH/PTHrP receptor occurs *in vitro*.

5. The method of claim 1, wherein said contacting the cell expressing a PTH/PTHrP
20 receptor with an agent that activates the PTH/PTHrP receptor occurs *in vivo*.

6. The method of claim 1, wherein the agent that activates the PTH/PTHrP receptor is PTH, a PTH analogue, or a PTH/PTHrP receptor agonist.

25 7. The method of claim 1, wherein the growth and maintenance of hematopoietic progenitor cells occurs *in vitro*.

8. The method of claim 1, wherein the growth and maintenance of hematopoietic progenitor cells occurs *in vivo*.

30 9. A method for enhancing the growth and maintenance of hematopoietic progenitor cells, the method comprising:

contacting a hematopoietic progenitor cell with a cell expressing a PTH/PTHrP receptor and contacting the cell expressing a PTH/PTHrP receptor with an agent that activates the PTH/PTHrP receptor to induce self-renewal of the hematopoietic progenitor cell.

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10. The method of claim 9, wherein the contacting occurs *in vitro*.

11. The method of claim 9, wherein the contacting occurs *ex vivo*.

10 12. A method for enhancing the growth or maintenance of hematopoietic progenitor cells in a subject, the method comprising:

administering to a subject in need of hematopoietic cell growth or maintenance an agent that activates the PTH/PTHrP receptor in cells of the subject expressing the PTH/PTHrP receptor, in an amount effective to support the growth or maintenance of
15 hematopoietic progenitor cells.

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13. The method of claim 12, wherein the cell expressing a PTH/PTHrP receptor is chosen from an osteoblast, a lymphoreticular stromal cell, and a mixture of osteoblasts and lymphoreticular stromal cells.

14. The method of claim 12, wherein the cell expressing a PTH/PTHrP receptor is a hematopoietic progenitor cell.

15. The method of claim 12, wherein the agent that activates the PTH/PTHrP receptor is
25 PTH, a PTH analogue, or a PTH/PTHrP receptor agonist.

16. The method of claim 12, wherein the subject in need of such treatment is a bone marrow donor.

30 17. The method of claim 16, wherein the subject in need of such treatment has donated bone marrow.

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18. The method of claim 16, wherein the subject in need of such treatment has yet to donate bone marrow.
19. The method of claim 12, wherein the subject in need of such treatment is a bone marrow transplant recipient.
20. The method of claim 12, wherein the subject in need of such treatment is a subject having hematopoietic progenitor cells under environmental stress.
21. The method of claim 12 wherein the subject in need of such treatment is a subject having anemia.
22. A method for enhancing mobilization of hematopoietic progenitor cells, the method comprising:
- administering to a subject in need of such treatment an agent that activates a PTH/PTHrP receptor in an amount sufficient to enhance mobilization of hematopoietic progenitor cells in the subject.
23. A method for preparing hematopoietic progenitor cells comprising:
- administering to a subject an agent that activates a PTH/PTHrP receptor in an amount effective to promote in the subject hematopoietic cell growth, maintenance or mobilization, and then harvesting from the subject hematopoietic progenitor cells.
24. The method of claim 23 wherein the hematopoietic cells are harvested from blood.
25. An isolated population of stromal cells treated with PTH.
26. A method for stimulating immune cell expansion comprising:
- contacting an immune cell with a cell expressing a PTH/PTHrP receptor and contacting the cell expressing a PTH/PTHrP receptor with an agent that activates the PTH/PTHrP receptor to induce immune cell expansion.

27. The method of claim 26, wherein the contacting occurs *in vitro*.

28. The method of claim 26, wherein the contacting occurs *ex vivo*.

5 29. A method for enhancing immune cell expansion in a subject, the method comprising:
administering to a subject in need of immune cell expansion an agent that activates a
PTH/PTHrP receptor in cells of the subject expressing the PTH/PTHrP receptor, in an
amount effective to support immune cell expansion.

10 30. The method of claim 29, wherein the cell expressing a PTH/PTHrP receptor is a
progenitor cell.

31. The method of claim 29, wherein the agent that activates the PTH/PTHrP receptor is
PTH, a PTH analogue, or a PTH/PTHrP receptor agonist.

15 32. The method of claim 29, wherein the subject in need of treatment is in need of B-cell
expansion.

33. The method of claim 29, wherein the subject in need of treatment is in need of T-cell
20 expansion.

34. The method of claim 29, wherein the subject in need of treatment is in need of platelet
expansion.

25 35. The method of claim 29, wherein the subject in need of treatment is in need of
basophil cell expansion.

36. The method of claim 29, wherein the subject in need of treatment is in need of
neutrophil cell expansion.

30 37. The method of claim 29, wherein the subject in need of treatment is in need of
macrophage cell expansion.

38. A method for enhancing hematopoietic cell growth or maintenance in vitro comprising:

contacting hematopoietic cells with a population of cells enriched for osteoblasts.

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39. The method of claim 38 further comprising contacting osteoblasts with PTH, a PTH analogue, or a PTH/PTHrP receptor agonist.

40. The method of claim 38 further comprising contacting a hematopoietic cell with a

10 Notch-1 receptor agonist.

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